

**Lehnert GmbH**

Service-Abteilung

# HIFI-SYSTEM 9000

SERVICE - UNTERLAGEN / SERVICE MANUAL

## DIRECT DRIVE TURNTABLE

WITH CARTRIDGE

Modell/Model PS 904



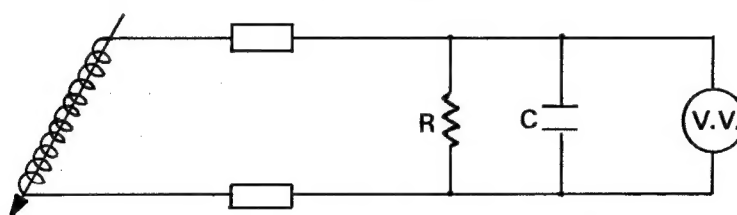
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## SPECIFICATIONS

DRIVE SYSTEM .....	Direct drive
TYPE OF MOTOR .....	72 pole FG AC Servomotor
RATED SPEED .....	2 speed, 33-1/3 and 45 rpm.
TONE ARM ASS'Y	
Type of system .....	Static balance
Head shell .....	Detachable, aluminum pressed
Counter weight .....	Adjustable.
Anti-skating system .....	Adjustable spring type.
Cartridge .....	Shure M-75-6S-M
STYLUS PRESSURE .....	2 gr $\pm$ 0.5 gr
STARTING TORQUE .....	250 gr - cm
POWER CONSUMPTION .....	12 W
SPEED ADJUSTABLE RANGE (Pitch control)	
45 rpm .....	-3%
33-1/3 rpm .....	-3%
LOAD REGULATION	
Speed deviation range at 45 rpm .....	within 0.2%
Speed deviation range at 33-1/3 rpm .....	within 0.2%
WOW AND FLUTTER .....	0.15%
STARTING TIME .....	3.0 Sec.
SPEED DRIFT .....	within 0.3%
S/N RATIO	
2nd Frequency component (75-150 Hz) .....	55 dB
INSULATION RESISTANCE TEST .....	10 Mohm
DIELECTRIC TEST .....	Apply 4000V 50Hz

### CIRCUIT DIAGRAM FOR TEST AND MEASUREMENT



R: 50Kohm  
C: 200pF  
VTVM: Zin 1 Mohm or more

POWER SOURCE .....	220V 50Hz
ACCESSORIES .....	45 rpm adapter Shell stand
TOTAL DIMENSIONS .....	(W) 448 x (D) 354 x (H) 172 mm
NET WEIGHT .....	9 Kg.

## TROUBLESHOOTING

Sympton	Cause	Remedies
Platter does not rotate when tone arm is moved manually or by automatic start operation.	<ol style="list-style-type: none"> <li>1. Motor is not powered.</li> <li>2. Motor and motor circuit are defective.</li> <li>3. Switch lever remains in contact with the switch.</li> </ol>	<ul style="list-style-type: none"> <li>* Check if the power cord is plugged in or the fuse is blown when the neon lamp also does not light.</li> <li>* Check the transistors in the power circuit.</li> <li>* Check voltage of each part of the servo circuit board.</li> <li>* Adjust the switch lever for correct clearance.</li> </ul>
Platter speed is not correct.	<ol style="list-style-type: none"> <li>1. The circuit board is out of fine adjustment.</li> </ol>	<ul style="list-style-type: none"> <li>* Adjust so that it rotates correctly for either 33 or 45 rpm.</li> </ul>
Motor rotates at high speed without being controlled by the servo system.	<ol style="list-style-type: none"> <li>1. The printed pattern, capacitors etc. are short-circuited. (Capacitors particularly should be checked carefully.)</li> </ol>	<ul style="list-style-type: none"> <li>* Separate the short-circuited points.</li> </ul>
Unbalanced motor rotation.	<ol style="list-style-type: none"> <li>1. Platter is not correctly fitted in place.</li> <li>2. Any one of transistors in the drive unit is defective.</li> </ol>	<ul style="list-style-type: none"> <li>* Fit the platter on the motor shaft correctly.</li> <li>* Check voltage.</li> </ul>
Platter stops at a point when held by hand. (Dead point occurs.)	<ol style="list-style-type: none"> <li>1. Either one of the Hall elements is defective.</li> <li>2. Input or output of the Hall elements is incompletely soldered.</li> </ol>	<ul style="list-style-type: none"> <li>* Replace</li> <li>* Solder it completely.</li> </ul>
Cycle change will not work.	<ol style="list-style-type: none"> <li>1. Trip lever and engagement shoe of the main gear malfunction.</li> </ol>	<ul style="list-style-type: none"> <li>* Check that trip lever returns after completing the change cycle, and that the engagement shoe moves smoothly and freely with its own weight.</li> </ul>
No sound is reproduced while playing.	<ol style="list-style-type: none"> <li>1. Cartridge is defective.</li> <li>2. Wiring is not correct. (Live and earth are connected inversely.)</li> <li>3. Stylus is defective.</li> <li>4. Amplifier is defective.</li> </ol>	<ul style="list-style-type: none"> <li>* Replace</li> <li>* Check the wiring</li> <li>* Replace</li> <li>* Check the amplifier</li> </ul>
Stylus does not follow the groove correctly.	<ol style="list-style-type: none"> <li>1. Dust or foreign matter is in the record groove.</li> <li>2. Stylus is dirty or defective.</li> <li>3. Lead wires in tone arm are tangled or too tight.</li> <li>4. Tracking force is abnormal.</li> <li>5. Tone arm bearings have too much friction.</li> </ol>	<ul style="list-style-type: none"> <li>* Clean</li> <li>* Clean or replace.</li> <li>* Slacken the wires.</li> <li>* Adjust</li> <li>* Replace tone arm</li> </ul>
Motor rumble is heard while playing.	<ol style="list-style-type: none"> <li>1. Motor is defective.</li> <li>2. Transformer is defective.</li> </ol>	<ul style="list-style-type: none"> <li>* Check if bearing shake is excessive.</li> <li>* Replace it.</li> <li>* Check if the transformer is floating.</li> </ul>
Tone arm does not lead out.	<ol style="list-style-type: none"> <li>1. The lead-out groove is not standard.</li> </ol>	<ul style="list-style-type: none"> <li>* It may not lead out when old or non-standard records such as film records are used.</li> <li>* Lead-out will not occur if the pitch of the lead-out groove is less than 3mm.</li> <li>* Check if the tracking force is correct.</li> <li>* Check if trip mechanism does not operate smoothly.</li> </ul>

## PARTS LIST FOR EXPLODED SCHEMATIC (A)

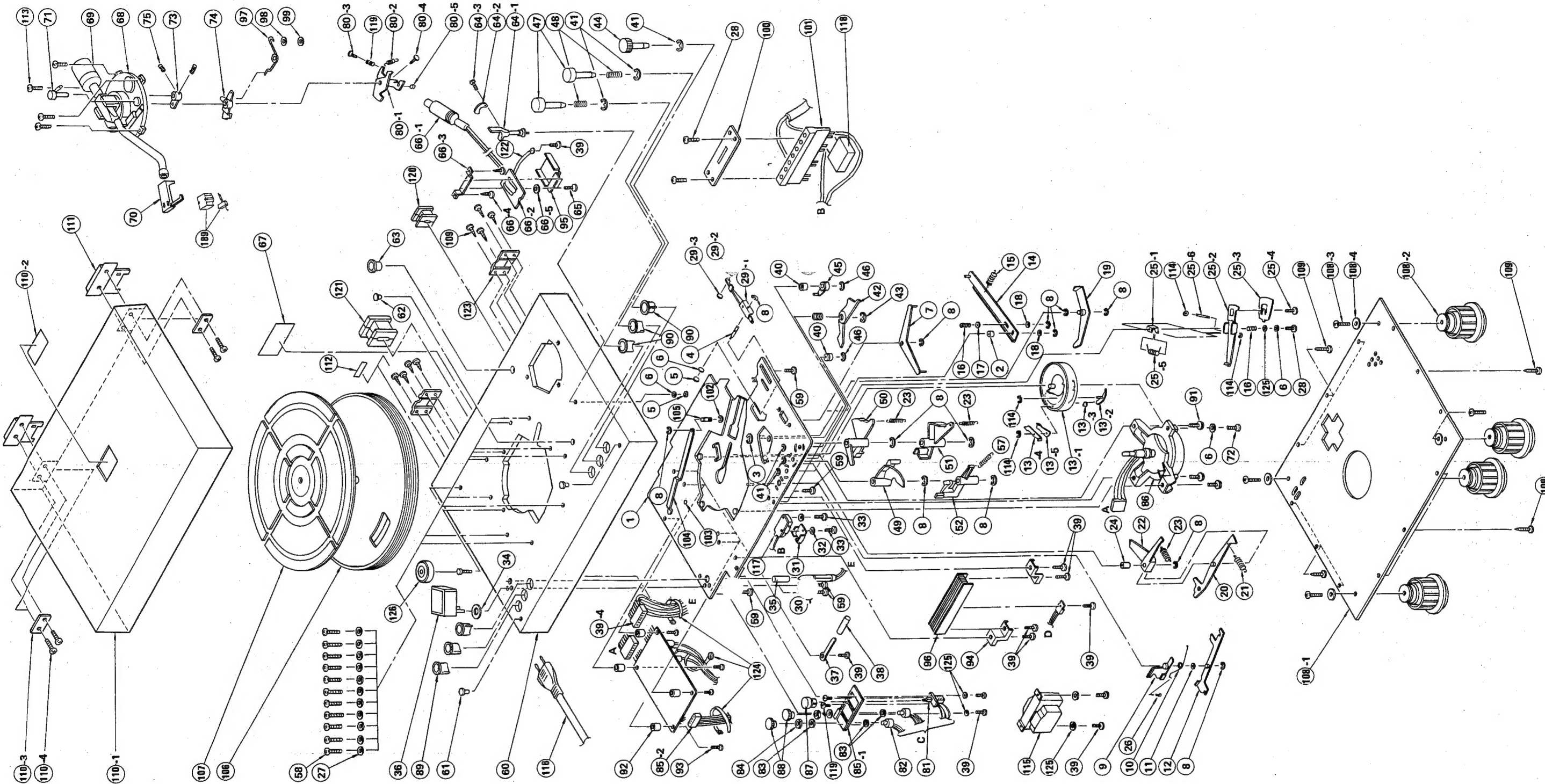
NO.	PARTS CODE NO.	DESCRIPTION	Q'TY
1	851077	Sub Chassis Ass'y	1
2	891428	Eccentric Shaft	1
3		E-Type Bow-washer, E-6	1
4	890095	Cut Lever Shaft	1
5		3 mm Lock Nut for Armrest, FLN-3	6
6		3 mm Spring Washer for Armrest, SSW-3	2
7	891431	Switch Lever (1) Ass'y	1
8		3 mm Dia. E-Type Washer, E-3	12
9	891432	Clutch Lever	1
10	891474	Clutch Lever Spring	1
11		Iron Washer, FW 6 $\phi$ x 13 $\phi$ x 0.5t	1
12	891016	Switch Lever (2) Ass'y	1
13	870317	Main Gear Ass'y	1
13-1	892675	Main Gear Ass'y (1)	1
13-2	891007	Change Lever Ass'y	1
13-3	891485	Change Lever Spring	1
13-4	891850	Clutch Plate	1
13-5	891005	Clutch Guide	1
14	891435	Select Arm Ass'y (1)	1
15	891438	Select Arm Spring	1
16	891475	Safety Spring	2
17		Iron Washer, FW 4.5 $\phi$ x 12 $\phi$ x 0.8t	1
18		Iron Washer, FW 4.5 $\phi$ x 12 $\phi$ x 0.5t	2
19	891437	Select Guide Ass'y (1)	1
20	870157	Start Lever Ass'y (1)	1
21	891443	Start Lever Spring	1
22	891444	Repeat Lever	1
23	893566	Cam Spring	3
24	891445	Bush (1)	1
25	870172-1	Revolver Arm Ass'y	1
25-1	892475	Revolver Base	1
25-2	891021-1	Revolver Arm Ass'y (1)	1
25-3	891022-1	Revolver Plate (2)	1
25-4		3 x 6 mm Round-head Screw, FMT $\oplus$ 3 x 6	1
25-5	891949	Revolver Plate Spring	1
25-6	891064	Revolver Plate Shaft	1
26	891947	Clutch Lever Coil Spring	1
27		Iron Washer, FW 3.2 $\phi$ x 10 $\phi$ x 1t	3
28		3 x 6 mm PH-Type Round-head Screw, FM $\oplus$ 3 x 6	5
29	891785	Cueing Seasaw Ass'y	1
29-1	891784	Cueing Seasaw	1
29-2	891066	Eccentric Pin (2)	1
29-3		E-Type Bow-washer, E-3	1
30	871100-3	Power Source Connector Ass'y	1
30-4	895205	Connector Housing	1
30-6	894001-1	Neon Lamp NE-2HU	1
31	890335	Switch Cover	1
32		Iron Washer, FW 3.2 $\phi$ x 6 $\phi$ x 0.5t	2

NO.	PARTS CODE NO.	DESCRIPTION	Q'TY
33		3 x 16 mm PH-Type Round-head Screw, FM $\oplus$ 3 x 16	3
34		O-Type Ring, P-8	1
35	895692	UL-Tube 6.6 $\phi$ x 7.7 $\phi$ x 24	1
36	895659	Lamp Housing	1
37	890755	Lag	2
38		UL-Tube, 3 $\phi$ x 60	2
39		3 x 8 mm Round-head Tapped Screw, BT $\oplus$ 3 x 8	7
40	896261	Lever Boss	3
41		5 mm E-Type Bow-washer, E-5	3
42	893557	Repeat Cancellor	1
43		6 mm Dia. E-Type Washer, E-6	1
44	895173	Repeat Lever Ass'y	1
45	895174	Repeat Cam	1
46		E-Type Bow-washer, E-3	1
47	895177	Operation Button Ass'y	2
48	892084-1	Button Spring	2
49	895178	Operation Lever	1
50	895179	Start Cam (1) ABS	1
51	895181	Start Cam (2) ABS	1
52	895183	Reject Lever ABS (Black)	1
57	892000-1	IFC Spring	1
58		3 x 16 mm Round-head Tapped Screw, BT $\oplus$ 3 x 16	11
59		3 x 8 mm Round-head Screw, FMT $\oplus$ 3 x 8	4
60	846696	Cabinet Case	1
61	892874	Dust Cover Cushion (Black)	2
62	895188	Bush (Return Adjustment)	1
63	892373	Head Shell Stand	1
64	895322	Tone Arm Rest Ass'y	1
64-1	895321	Arm Rest Base	1
64-2	890429-1	Lock Lever	1
64-3		Lock Screw, FMT $\oplus$ 2.6 x 6	1
65		Round-head Screw, WM $\oplus$ 3 x 8	2
66	896793	Phone P. C. Board Ass'y	1
66-1	895891-1	Signal Cable Ass'y	1
66-2	895155	Phone P. C. Board	1
66-3	895154	Phone P. C. Board Fixing Angle	1
66-4		3 x 8 mm Round-head Tapped Screw, BT $\oplus$ 3 x 8	2
66-5		3 mm Gathered Washer, TOW-3	1
67	896660	PL Rating Label	1
68	851433	Tone Arm Base Ass'y	1
69	851432	Tone Arm Body Ass'y (Weight lessening)	1
70	896786	Head Shell	1
71	896263-1	Select Lever Ass'y	1
72		3 x 8 mm Round-head Screw, FM $\oplus$ 3 x 8	1
73	895594	Select Lever	1
74	896151	Selector	1
75		2.6 x 3 mm Stopping Screw, FT $\ominus$ 2.6 x 3	2

NO.	PARTS CODE NO.	DESCRIPTION	Q'TY
76	896771	Elevation Shaft	1
77	832780	Elevation Spring	1
78	892805	Elevation Plate	1
79		2.6 x 5 mm Stopping Screw, FT $\ominus$ 2.6 x 5 (Elevation Plate)	1
80	895867-1	Forward Base (4) Ass'y	1
80-1	895866-1	Forward Base (3) Ass'y	1
80-2	801554	Arm Spring	1
80-3		3 x 20 mm Hexagonal Head Screw, M 3 x 20	1
80-4		3 x 6 mm Hexagonal Head Screw, M 3 x 6	2
80-5	891452-1	Friction Rubber	1
81	851105	Switch (Speed Select)	1
82	703062	Volume Control VM 10A	2
85	871056	Volume Switch Ass'y	1
85-1	895196	Volume Angle	1
85-2	895384	Miniature Connector Ass'y	1
86	631400	Motor Ass'y	1
87	895198	Speed Control Button Ass'y	1
88	895199	Speed Select Button Ass'y	2
89	895202-1	Button Bush (1) black	3
90	895203-1	Button Bush (2) black	3
91		4 x 10 mm Round-head Screw, FM $\oplus$ 4 x 10	3
92	832380-2	Motor Spacer	4
93		3 x 20 mm Round-head Tapped Screw, BT $\oplus$ 3 x 20	4
94	895376	Heatsinker Angle	2
95	895218	Screen Plate	1
96	704136	Heatsinker	1
97	896227	Click Spring	1
98		Iron Washer, FW 3 $\phi$ x 10 $\phi$ x 0.5t	1
99	CSTW 3	CS-Tight Washerr	1
100	895521	Terminal Plate	1
101	894691	Collar Terminal Plate	1
103		4 $\phi$ Steel Ball	1
104	870066	Actuating Arm	1
105	895738	Actuating Arm Pin (Snap Pin)	1
106	620021-1	Turntable	1
107	870034	Turntable Sheet	1
108	871548	Bottom Cabinet Board Ass'y	1
108-1	871563	Bottom Cabinet Board (Lid)	1
108-2	896473	Insulator (Foot Ass'y)	4
108-3		4 x 12 mm Round-head Screw, FM $\oplus$ 4 x 12	4
108-4		Iron Washer, FW 4 $\phi$ x 10 $\phi$ x 0.5t	4
109		3.1 x 13 mm Round-head Screw, WM $\oplus$ 3.1 x 13	18
110	851117-3	Dust Cover Ass'y	1
110-1	850201-6	Dust Cover	1
110-2	896661	Cover Cushion (Namer)	1
110-3	895231	Hinge Plate	2
110-4		4 x 8 Round-head Screw, FM $\oplus$ 4 x 8	2

NO.	PARTS CODE NO.	DESCRIPTION	Q'TY
111	895215	Hinge Ass'y	2
112	892031	No. Label	1
113		3 x 10 mm Flat Head Screw (Black), $\oplus$ 3 x 10	4
114		2 mm E-Type Washer, E-2	2
115	871562	Power Transformer Ass'y	1
116	895617	2-Pin Power Supply Cord Ass'y	1
117	870270	Micro Switch	1
118	892428	Condenser 0.047 PF, Rifa	1
119	813681	Lock Spring	1
119-1	895891	DIN Plug Connection Cord	1
120	871025	Cord Bushing (1)	1
121	871026	Cord Bushing (2)	1
122	891965	Earth Wire Ass'y	1
123	895259	Lock Plate	2
124	894408	Wire Fastener	8
125		Iron Washer, FW 3.2 $\phi$ x 7 $\phi$ x 0.5t	8
126	890876	45 RPM Adapter	1
127	851432	Main Weight Ass'y	1
128	846724	Carton Box	1
		1) Sleeve	(1)
		2) Master Carton	(1)
		3) Top Pad	(1)
		4) Accessory Pad	(1)
		5) Turntable Case	(1)
129	846499-1	Packing Corner	2
130		Poly. Bag (for Head Shell, Adaptor, Main Weight) 70 x 120	1
131		Poly. Bag (for Turntable), 300 x 400 x 0.3t	1
132		Poly. Bag (for Instruction Booklet), 250 x 350	1
133	827471	Poly. Bag (for Player)	1
	4910402572	Instruction Booklet	1
	4910402550	Guarantee Card	1
189	1004011289	Cartridge "SHURE" (M-75-6S-M)	1
134	631399	Circuit Ass'y	1
135	631282	P. C. Board	1
136		Transistor 2SC 1449 (K) (L), X2	1
137		Transistor 2SC 945 (P), X3-X8, X10	7
138		Transistor 2SA 641 (M), X9, X11	2
139		Bridge Diode SIRBA-40, D8	1
140		Diode F 14C or 1S 1887, D5	1
141		Diode RD 13E (B), D6	1
142		Diode VD 1121, D7	1
143	702233-1	Insulating Tube (1) 10 $\phi$ x 5l (Black)	4
144		Metalized Polyester Capacitor 3.5 $\mu$ F 200WV, C101	1
145		Electrolytic Capacitor, 10 $\mu$ F 350V(250V), C1	1
146		" " 100 $\mu$ F 50V, C2	1
147		" " 100 $\mu$ F 25V, C3	1
148		" " 0.47 $\mu$ F 25V (16V), C13, C14	2
149		" " 1 $\mu$ F 25V (16V), C15	1

EXPLODED SCHEMATIC (A)



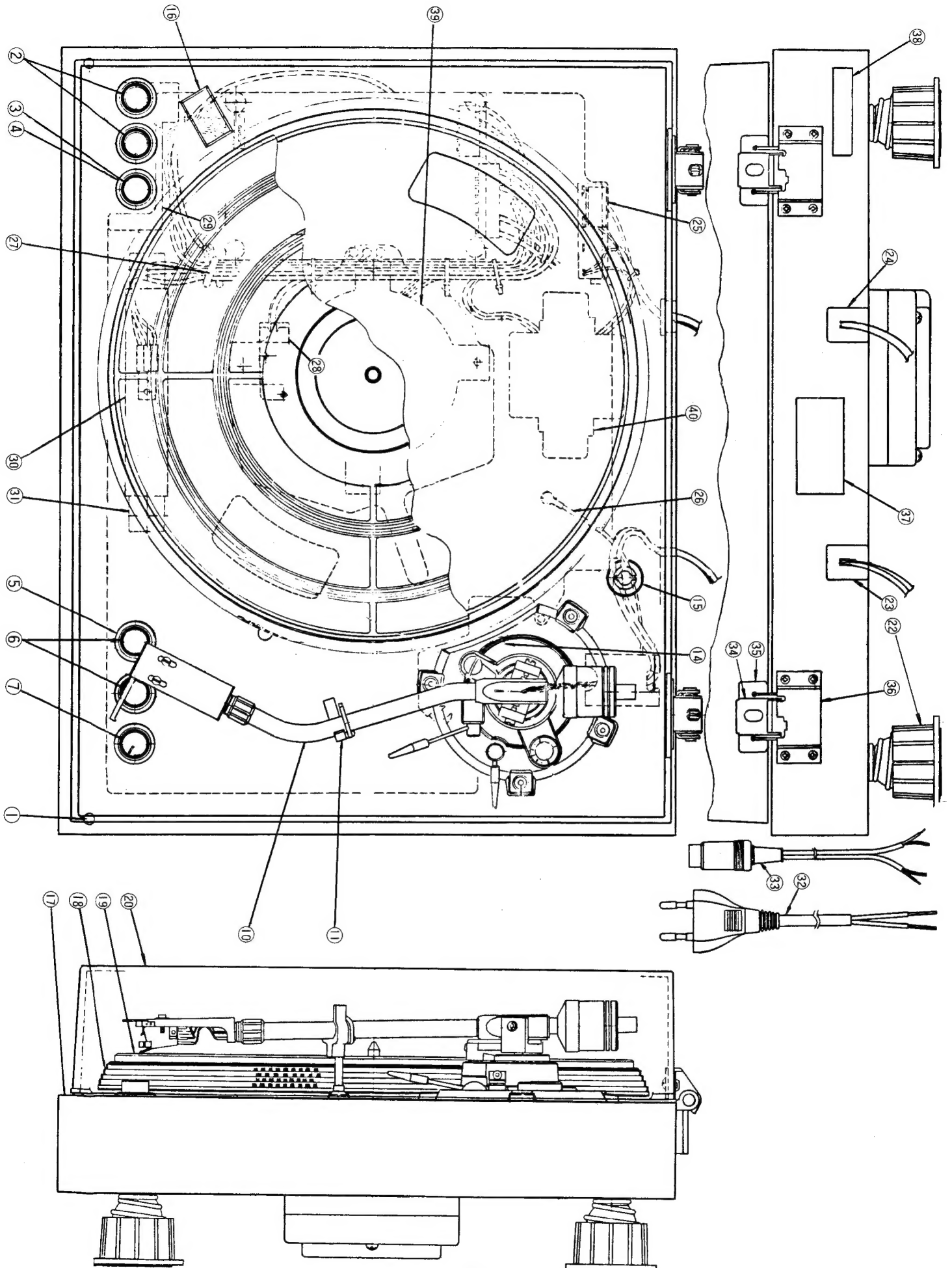


NO.	PARTS CODE NO.	DESCRIPTION	Q'TY
150		Ceramic Capacitor 220PF 50V±10%,C4, C5	2
151		Mica Capacitor 0.01μF 50V±10%, C6, C9, C10, C12	4
152		Mica Capacitor 0.1μF 50V±10%, C7, C8, C11	3
153		Cement Resistor, Vertical, 1 Kohm 10W (K) RGB, 10PH, R101	1
154		Cement Resistor, Vertical, 1 Kohm 7W (K) RGB 7PH, R102	1
155		Cement Resistor, Horizontal, 4.7 ohm 2W (K), R103	1
156		Oxidized Metal Film Resistor 2.2 Kohm 2W (J), R104	1
157		" " " " 8.2 Kohm 2W (J), R105	1
158		Carbonic Resistor 1/4WW(J) 5.6 Kohm, R1, R3	2
159		" " " " 27 Kohm, R2	1
160		" " " " 82 Kohm, R4, R5	2
161		" " " " 12 Kohm, R6, R7, R23	3
162		" " " " 15 Kohm, R10, R11, R13	3
163		" " " " 470 Kohm, R12	1
164		" " " " 33 Kohm, R14, R22	2
165		" " " " 1.8 Kohm, R15	1
166		" " " " 6.8 Kohm, R16, R17	2
167		" " " " 8.2 Kohm, R8, R21	2
168		" " " " 10 Kohm, R20, R24	2
169		" " " " 470 ohm, R25	1
170		" " " " 18 Kohm, R26, R8, R9	3
171		" " " " 1 Kohm, R27	1
172		" " " " 330 Kohm, R28	1
173		" " " " 4.7 Kohm, R19	1
174		5ø Fuse Holder	2
175		Metal Pipe 56 BN 1109	6
176		Volume Control 5 Kohm (B) 1/4W, VRK 4-1, VR1—VR3	3
177	399253-5	Connector Post (Speed Control) No.5048-05A	1
178	704134	Right Angle Wafer Ass'y (A), No.3029-5A	1
179	704135	Right Angle Wafer Ass'y (B), No.5154-07A	1
180		Power Transistor (connecting with Terminal No.3, 4, 5) 2SC 2022 (O) or (Y), X1	1
181 - 186	703448-1	Lead Wires	1 kit
187	892171	Fuse 500 mA, 250V, 5ø	1
188	703621	Fuse Label (500 mA T)	1

## PARTS LIST FOR EXPLODED SCHEMATIC (B)

NO.	PARTS CODE NO.	DESCRIPTION	Q'TY
1	892874	Dust Cover Cushion (Black)	2
2	885199	Speed Control Button Ass'y	2
3	895198	Speed Select Button Ass'y	1
4	895202	Button Guide (1)	3
5	895203	Button Guide (2)	3
6	895177	Control Button Ass'y	2
7	895173	Repeat Lever Ass'y	1
10	851432	Tone Arm Ass'y	1
11	895322	Arm Rest Base Ass'y	1
14	892805	Elevation Plate	1
15	892373	Shell Stand	1
16	896659	Lamp Housing	1
17	846696	Cabinet Case	1
18	620021-1	Turntable	1
19	870034	Turntable Sheet	1
20	851117-3	Dust Cover Ass'y	1
22	896473	Insulator (Foot Ass'y)	4
23	871025	Cord Bushing (1)	1
24	871026	Cord Bushing (2)	1
25	851080-2	Sub-chassis Mechanism Ass'y	1
26	891965	Earth Wire Ass'y	1
27	890755	Lag	1
28	895280	Micro Switch Ass'y	1
29	871056	Volume Switch Ass'y	1
30	704136	Heatsinker	1
31	895376	Heatsinker Angle	2
32	895617	2-Pin Power Supply Cord Ass'y	1
33	896793	PH P.C. Board Ass'y	1
34	895215	Hinge Ass'y	2
35	895231	Hinge Plate	2
36	895259	Lock Plate	2
37	896660	PL Rating Label	1
38	892031	No. Label	1
39	631400	Motor Ass'y	1
40	871562	Power Transformer	1

# EXPLODED SCHEMATIC (B)



# PRINTED CIRCUIT BOARD DIAGRAM

